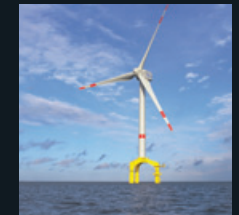
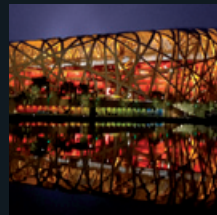


Integrated Solutions

Your Load Under Perfect Control



Enerpac Integrated Solutions

With more than 50 years of experience, Enerpac has gained unique expertise in delivering hydraulic solutions for the controlled movement and positioning of structures.

This expertise has been acknowledged by the world's leading industrial professionals and has contributed to the successful movement of a number of the most recognisable structures on earth.

In addition to providing the most comprehensive line of globally-supplied, locally-supported products, Enerpac combines hydraulics, steel fabrication and electronic control with engineering and application knowledge, to design and manufacture solutions that ensure your projects are completed safely and efficiently.

- **HYDRAULIC GANTRIES** *page 4*
- **STRAND JACKS** *page 5*
- **SKIDDING SYSTEMS** *page 6*
- **SELF-PROPELLED MODULAR TRAILER** *page 7*
- **SYNCHRONOUS LIFTING SYSTEMS** *page 8*
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- **PROJECT GALLERY** *pages 10-27*

EXPERIENCE and EXPERTISE



ELECTRONICS

Enerpac designs all control systems in-house. This capability keeps control technology close to the design engineers who are developing the rest of the system. In doing so, we can tailor the control system to match unique project requirements.



STEEL FABRICATION

Enerpac has a dedicated facility for steel fabrication and welding. We can design, procure and manufacture custom structures used in demanding heavy-lifting applications.



MAINTENANCE and REPAIR

Due to the unique nature of Enerpac's Integrated Solutions systems, we offer complete maintenance and repair services. Our M&R group is available to assist customers who do not have access to local service facilities qualified to work on these systems.



ENGINEERING

Enerpac has a multi-disciplined engineering team capable of design and development of all aspects of an Integrated Solutions system. Leveraging design and application experience with the latest in computer software, rapid prototyping and analysis methods ensures delivery of the highest quality systems.



MACHINING

Enerpac utilises the latest in CNC machining technologies and manufactures all large and special hydraulic cylinders in-house. We can machine diameters up to 1000 mm with lengths to 6000 mm.



HYDRAULIC POWER UNITS

Enerpac designs, assembles and tests small to large hydraulic power units in-house. Power units range from 0,5 to 240 kW and are tested with the system they are intended to operate.



FIELD SUPPORT

Enerpac Integrated Solutions is available to provide on-site support including training and troubleshooting of systems. We also stock repair parts and consumable items at several locations to ensure fast delivery and minimal downtime.

HYDRAULIC GANTRIES

The complete range of hydraulic gantries for your most demanding lifting and rigging operations

Hydraulic gantries are a safe, efficient way to lift and position heavy loads in applications where traditional cranes will not fit and permanent overhead structures for job cranes are not an option.

When used with skid tracks, gantry cranes also provide a means for moving and placing heavy loads, many times with only one pick.

Enerpac offers two series of hydraulic gantry systems: the cost effective SL-Series that offers entry level control and capacity, and the heavy duty SBL-Series that offers capacities up to 1000 metric ton and 3-stage lifting capability.

All Enerpac gantries are delivered with specific properties and control systems to ensure optimum stability and safety.

Hydraulic Gantries							
Capacity (with 4 towers) (kN)			Model Number	Lift Height (mm)			Weight (per tower) (kg)
1st stage	2nd stage	3rd stage		1st stage	2nd stage	3rd stage	
600	600	-	SL60	3387	4956	-	1050
1250	1250	-	SL125	4635	6700	-	2130
5100	5100	2940	SBL500	4950	6850	8560	6500
8984	5807	3176	SBL1000	4942	6852	8562	8550
10.476	6748	3764	SBL1100	7004	9668	12.002	11.950



OVERVIEW



KEY FEATURES:

- Self-contained hydraulics and electrics
- Intellilift wireless control system
- Self-propelled wheels or tank rollers
- Foldable boom on **SBL1100**

STRAND JACKS

Ideal for continually lifting heavy loads precisely over long distances

A strand jack can be considered a linear winch.

In a strand jack, a bundle of steel cables or strands are guided through a hydraulic cylinder, above and below the cylinder are anchor systems with wedges that grip the strand bundle. By stroking the cylinder in and out while the grips are engaged in the anchors, a lifting or lowering movement is achieved.

Strand jacks were developed in the early 1970's and today are widely recognised as the most sophisticated and highest capacity heavy lifting solution.

When Enerpac first entered the heavy lifting market, strand jack technology was in its infancy. Enerpac immediately recognised the shortcomings of the existing technology.

Innovative design developments have improved reliability, durability, versatility and safety leading to the Enerpac HSL range of strand jacks to be adopted as the standard for heavy lifting.

Strand Jack				
Capacity	Strand Diameter	Model Number	Number of Strands	Weight
(kN)	(mm)			(kg)
300	15,7	HSL300	3	500
700	15,7	HSL700	7	640
2000	15,7	HSL2000	19	1300
3000	15,7	HSL3000	31	2180
5000	15,7	HSL5000	48	3150
450	18	HSL450	3	500
600	18	HSL600	4	650
1000	18	HSL1000	7	850
2000	18	HSL2000	12	1400
3000	18	HSL3000	19	2180
4500	18	HSL4500	31	3050
6500	18	HSL6500	43	3950
8500	18	HSL8500	55	5000
10.000	18	HSL10000	66	7650



OVERVIEW



KEY FEATURES:

- Two sizes strand: 15,7 and 18 mm diameter
- Full control of lifting and lowering through SCC control
- Complete line of electric and diesel power packs
- Full range of accessories
- Nickel plated telescopic pipes preventing bird caging
- Standard supplied with lifting anchor
- Guaranteed undisturbed locking – unlocking operation
- Special corrosion treated high endurance multi-use wedges

SKIDDING SYSTEMS

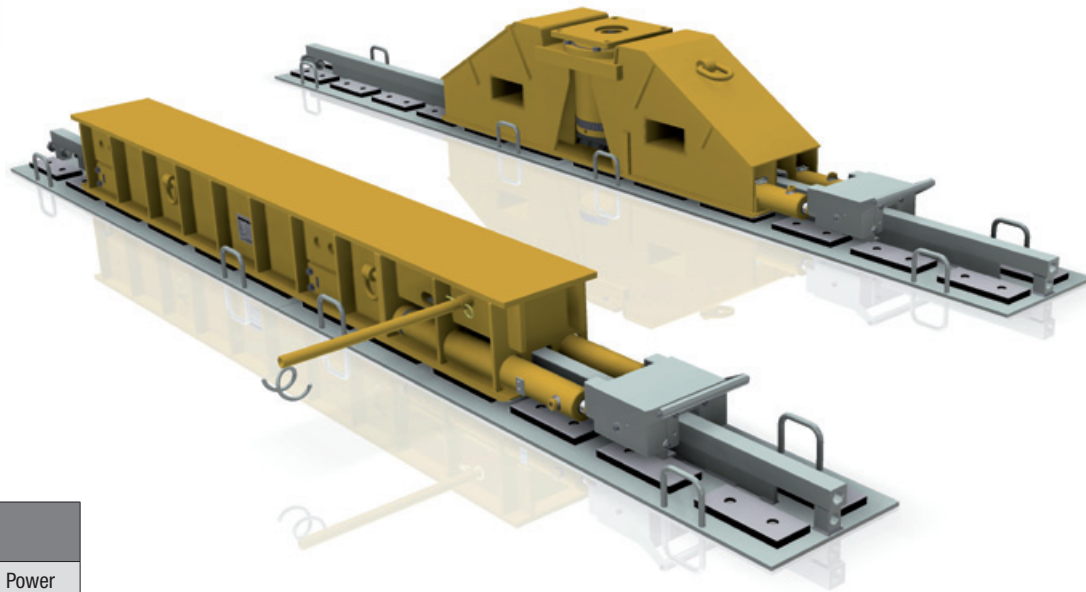
An ancient technology meets the 21st century

Skidding techniques have been used for centuries. Enerpac has applied high-pressure hydraulics to create the Enerpac HSK Skidding Systems.

The HSK skidding system is comprised of a series of skid-shoes powered by hydraulic push-pull cylinders, travelling over a pre-constructed track. A series of special PTFE coated blocks are placed on

the skid-tracks to reduce friction. The skid shoes are connected by hoses to a hydraulic diesel driven power pack.

In addition to our standard skidding systems we have the capabilities to create customised skidding systems to meet your specific requirements.



Skidding Systems		
Capacity (per shoe)	Model Number	Power Stroke
(kN)		(mm)
1250	HSK1250	600
2500	HSK2500	600

OVERVIEW



Enerpac Skidding Systems are available in two versions:

- **HSK1250** with a capacity of 1250 kN per skid unit
- **HSK2500** with a capacity of 2500 kN per skid unit

Both skidding systems are available in 2 varieties: using a “skid shoe jack” or a “skid shoe beam”. The skid shoe jack includes an integrated lifting cylinder. A skid shoe beam is designed for skidding purposes only.

To calculate the minimum required capacity per shoe, the entire load has to be able to rest safely on 2 of the 4 shoes. To skid a load of 500 ton, the required skidding system is **HSK2500**.

SELF-PROPELLED MODULAR TRAILER

Hydraulic strength in a linear drive transport system

The Enerpac Self-Propelled Modular Trailer features a minimised height and slim design, which make it very easy to operate in confined spaces.

Each trailer has 3 axles. Each wheel unit has a steering as well as a lifting cylinder at its disposal. Wheel propulsion is accomplished by hydraulic propulsion.

The trailer is controlled by Intellidrive, a wireless control system that allows the entire system to be operated by one person.

One of the unique features of the system is that it is able to be containerised. Two trailers and a power pack can be shipped inside just one 20 foot container.



OVERVIEW



KEY FEATURES:

- Multiple configurations possible
- Minimised height and slim design
- Intellidrive wireless control system
- One power pack per 3 trailers maximum

Self-Propelled Modular Trailer									
Capacity (per trailer) (kN)	Model Number	Transport Speed (1 trailer)		Steering Range	Lifting Range (mm)	Collapsed Height (mm)	Length (1 trailer) (mm)	Width (1 trailer) (mm)	Weight (per trailer) (kg)
		unloaded (km/h)	loaded (km/h)						
600	SPMT600	5	1,5	+175° to -175°	364	770	3075	2300	6850

SYNCHRONOUS LIFTING SYSTEMS

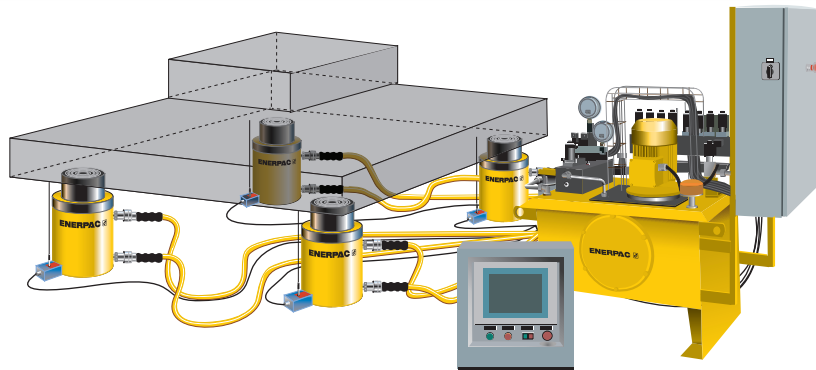
Combining the strength of high-pressure hydraulics with the control and accuracy of computers

Enerpac has been providing computer-controlled Synchronous Lifting for over 25 years. This experience is available to all our customers who need assistance with critical lifting applications. By combining the incredible strength of high-pressure hydraulics with the high-speed of today's computer systems, Enerpac has the expertise to lift some of the largest and unique structures on the planet.

Enerpac features two standard synchronous lifting systems, providing the level of force and control for

most applications. We can also provide customer systems tailored to unique project requirements. The modular SLCG system allows customers to use their existing standard Enerpac pumps and cylinders, providing an economical solution to basic lift/lower applications.

For more complex and demanding applications, the ESS system offers additional features including greater number of lift points, center of gravity, and tilting/weighing capabilities.



Synchronous Lifting Systems								
Lift Points	Model Number	Integrated Pump	Accuracy (mm)	Touch Screen Control	Options			
					Leveling	Weighing	CoG	Expandable
4, 8	SLCG	no	1	yes	no	yes*	no	no
4, 8, 12	ESS	yes	1	yes	yes	yes	yes	yes

* 4-point system includes weighing function.

OVERVIEW



KEY FEATURES:

- Accuracy of system over full stroke
- System is used with standard Enerpac single or double-acting cylinders
- Load and stroke alarms for optimal safety
- Customisable up to 64 points
- Data storage and recording capabilities

CUSTOM SOLUTIONS

SYNCHRONOUS HOISTING



A unique crane product for below-the-hook positioning of heavy loads that require precision placement. May reduce the number of cranes needed and reduce the costs for multiple picks.

BRIDGE LAUNCHING



Providing a solution for the most complex and demanding bridge construction applications, Enerpac has over 20 years experience providing unique customer bridge launching systems.

STRAND JACK GANTRY



The strand jack gantry is a steel structure to facilitate erection and skidding back, forth and sideways of heavy loads up to 1000 ton. The Enerpac strand jack gantry allows you to operate in confined spaces.

The system consists of 3 major components:

- Steel Construction
- Strand Jacks for Vertical Lifting (HSL-Series)
- Skidding System for horizontal skidding (HSK1250). This is powered by a hydraulic power unit that is situated on ground level.

The capacity, height and width of the construction can be modified in cooperation with our engineering team.

SELF-ERECTING TOWER



The Enerpac Self-Erecting Tower is a self-erecting-tower-lift system that enables you to build a free standing gantry from ground level. The Self-Erecting Tower can be supplied in various capacities and heights and is built with standard modular components, enabling a flexible solution to future project demands.

The Self-Erecting Tower enables moving the load in all directions: lifting, lowering, skidding back and forth, and side shift capabilities. Lifting and skidding are achieved using standard Enerpac strand jacks that can also be used for other applications.

The Self-Erecting Tower is a versatile lift-system that can be used in a wide variety of operations, for example the installation of reactor vessels in a petrochemical plant or erecting a shipyard crane. When compared with large capacity cranes, the Self-Erecting Tower significantly reduces transportation and set up costs.

PROJECT GALLERY

INFRASTRUCTURE *pages 11-14*

POWER GENERATION *pages 15-16*

OIL AND GAS *page 17*

MINING *pages 18-20*

SHIPBUILDING *pages 21-22*

SALVAGE *page 23*

BUILDINGS AND STADIUMS *pages 24-26*

PETROCHEMICAL *page 27*



■ PROJECT	Industrial Ring Road (IRR)
■ LOCATION	Bangkok, Thailand
■ YEAR	2007
■ EQUIPMENT	INCREMENTAL LAUNCHING EQUIPMENT

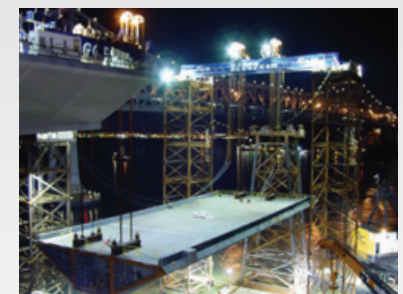
INFRASTRUCTURE



The industrial ring road was constructed to relieve traffic congestion in Bangkok's main industrial areas. This project was comprised of two 700 meter long, 172 meter high cable stayed bridges, and 13 kilometers of road. Enerpac designed and supplied hydraulic systems to launch and position the 1200 ton traveling formwork system to build the elevated approach road sections.

- PROJECT San Francisco-Oakland Bay Bridge
- LOCATION San Francisco, California, USA
- YEAR 2005-2013
- EQUIPMENT HSL-SERIES HEAVY LIFTING STRAND JACKS
SYNCHRONOUS LIFTING SYSTEM

INFRASTRUCTURE



State-of-the-art hydraulics are facilitating construction of the new San Francisco – Oakland Bay Bridge. Enerpac Strand Jacks and Synchronous Lifting Systems were used to erect key components of the bridge. The 1800 ton transition spans were lifted from a barge and raised to deck level using several 300 ton strand jacks. These spans link the east skyway to the self-anchored suspension (SAS) span. For the SAS tower, sections were raised into position using 650 ton strand jacks and then leveled using a 4 point synchronous lift system.

- PROJECT Millau Viaduct
- LOCATION France
- YEAR 2001-2005
- EQUIPMENT INCREMENTAL LAUNCHING EQUIPMENT
SYNCHRONOUS LIFTING EQUIPMENT



To create the world's largest bridge, the construction partnership of Eiffage and Enerpac developed hydraulic construction and control solutions for incremental deck launching, deck nose recovery, and temporary pier erection. Enerpac supplied the equipment that was necessary to safely manage the 35.000 ton, 2460 meter long steel deck, situated 270 meters in the air. It was launched around a 20 kilometer radius and positioned with millimeter precision.

INFRASTRUCTURE



- PROJECT Valencia Port Swing Bridge
- LOCATION Valencia, Spain
- YEAR 2008
- EQUIPMENT PERMANENT HYDRAULIC INSTALLATION

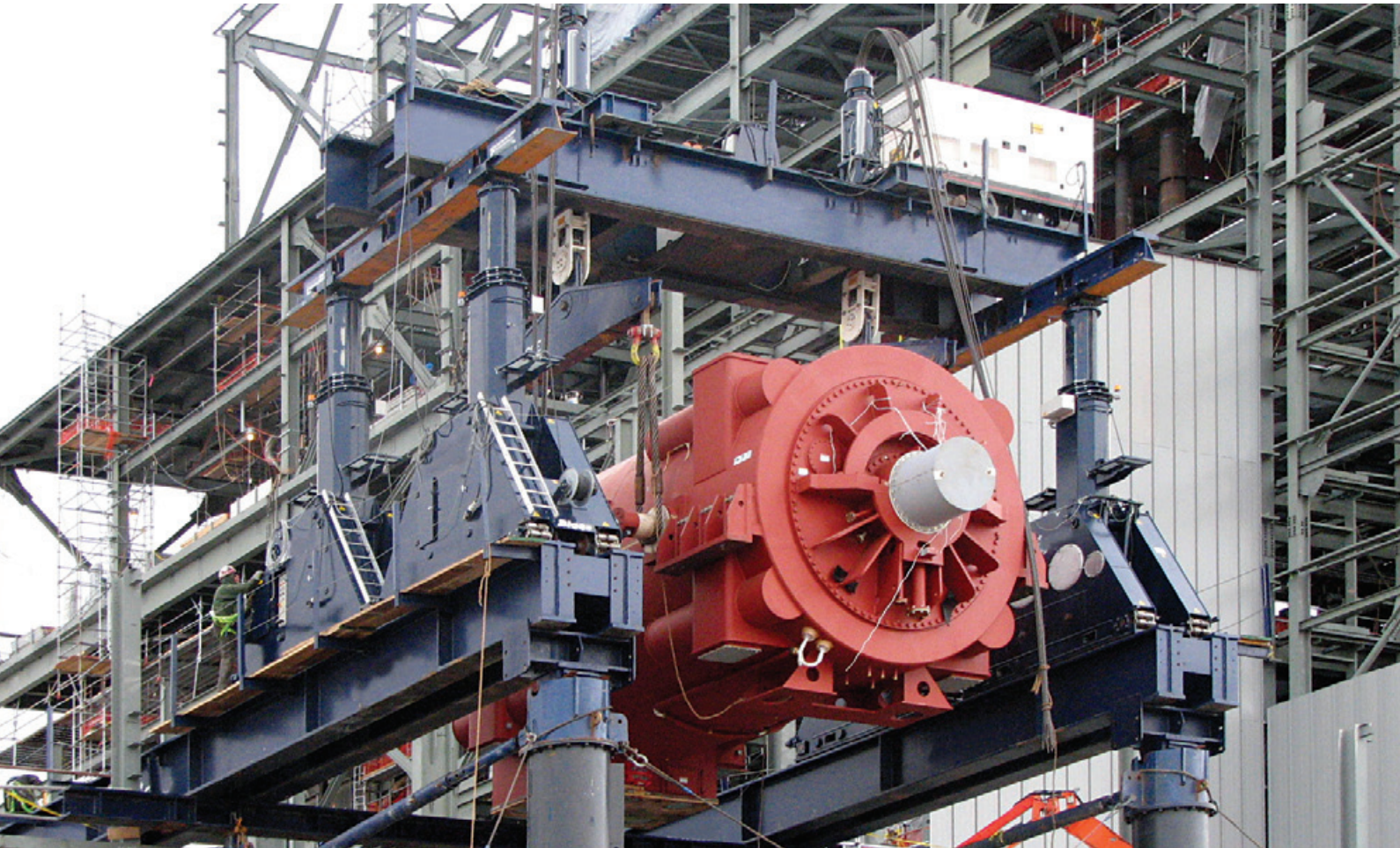
INFRASTRUCTURE



The balanced cantilever swing bridge crossing the street circuit in Valencia is actuated by Enerpac permanent hydraulic installation. Developed to allow yacht access in preparation for America's Cup, the bridge's design required a complex and failsafe digital hydraulic solution. Enerpac delivered actuation and a control system that successfully manages the 3200 ton counterbalance weight, spanning 99 meters, and operating 365 days per year.

- PROJECT TS Power Plant
- LOCATION Battle MT, Nevada, USA
- YEAR 2007
- EQUIPMENT SBL-SERIES HYDRAULIC GANTRY
HSL-SERIES HEAVY LIFTING STRAND JACKS

POWER GENERATION



At a coal-fired power plant, HSL-Series Strand Jacks are used to lift power train turbine modules up to 250 ton, at a height of 14 meters. The self-propelled tank rollers of the SBL1100 hydraulic gantry traverse the turbine longitudinally, 70 meters along the elevated runway.

- PROJECT Bard Offshore / Wind Farm
- LOCATION North Sea, Germany
- YEAR 2009
- EQUIPMENT EPS-SERIES SYNCHRONOUS LIFTING SYSTEM
CLRG-SERIES HIGH TONNAGE CYLINDER

POWER GENERATION



On the then first commercial offshore wind farm, wind turbines are installed with an Enerpac Synchronous Lifting System. The Enerpac system automatically adjusts and accurately positions the yoke on top of three deep pile foundations to provide a horizontal base. The turbine mast is then erected quickly and efficiently on the base.

- PROJECT Adriatic LNG
- LOCATION Porto Levante, Italy
- YEAR 2007
- EQUIPMENT HSK-SERIES SKIDDING SYSTEM
HSL-SERIES HEAVY LIFTING STRAND JACKS

OIL and GAS



Construction of the world's first LNG regasifier, built with 90.000 m³ of cement and 30.000 ton of steel, required lifting and skidding solutions that could stand up to these extreme conditions. Enerpac HSK-Series skidding systems, in conjunction with HSL-Series heavy lifting strand jacks, provided the solution, which compensated for skidding on uneven ground, and lifting deck modules and equipment of up to 3000 ton.

- PROJECT Dragline Mining Shovel Maintenance
- LOCATION Calama, Chile
- YEAR 2009
- EQUIPMENT ESS-SERIES SYNCHRONOUS LIFTING SYSTEM

MINING



Minimising equipment downtime is critical to mining operations. Enerpac provided a high capacity, safe, and efficient shovel maintenance lifting method. The Enerpac Synchronous Lifting System automatically lifts and lowers cylinders in unison negating the need for multiple jack operators. Synchronous lifting has increased safety and productivity.

- PROJECT Dragline Crane Maintenance
- LOCATION Queensland, Australia
- YEAR 2004
- EQUIPMENT ESS-SERIES SYNCHRONOUS LIFTING SYSTEM

MINING



Enerpac Synchronous Lifting technology helped manage maintenance operations on a 3500 ton dragline crane in the Australian outback safely and efficiently. The automatic synchronous lifting operation separated the crane from its base so that slewing bearings could be replaced. Lowering and tilting cycles realigned bearing surfaces successfully, permitting the crane to be put back in operation quickly, reducing maintenance downtime.

- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

Sino Iron Ore
Cape Preston, Australia
2009
HSL-SERIES HEAVY LIFTING STRAND JACKS

MINING



An Enerpac Strand Lift system was employed to construct Australia's largest ever magnetite mining and processing operation. With the HSL-series strand jack system, pairs of 800 ton iron ore mills and 1400 ton autogenous mills were lifted and then lowered onto their bearings 21 meters above the ground.

- PROJECT T45 Destroyers
- LOCATION Glasgow, Scotland
- YEAR 2006-2010
- EQUIPMENT ESS-SERIES SYNCHRONOUS LIFTING SYSTEM
RACL ALUMINIUM LOCK-NUT CYLINDERS



Hull sections for the UK Royal Navy's anti-air warfare destroyers are manufactured in 5 blocks, with the heaviest block weighing over 1400 ton. Prior to welding the blocks together to form the hull, the digitally controlled Enerpac Synchronous Lifting System lifts, weighs and positions the blocks, increasing efficiency and precision.



- PROJECT Ship Transport
- LOCATION Pascagoula, Mississippi
- YEAR 2011
- EQUIPMENT CUSTOM ESS SYNCHRONOUS LIFTING SYSTEM

SHIPBUILDING



Efficiency and accuracy are critical when preparing to load out a new ship. Enerpac developed a custom ESS synchronous lifting system to decrease the total time and the number of workers required to complete the operation. The 12 point lifting system includes powered hydraulic storage reel, electronic variable speed control and the ability to connect up to two additional 12 point units for even larger lifting jobs.

- PROJECT Platform Recovery
- LOCATION Germany
- YEAR 2010
- EQUIPMENT HSL-SERIES HEAVY LIFTING STRAND JACKS

SALVAGE



A salvage contractor's offshore platform installation was unstable and at risk. Enerpac presented the contractor with a fully engineered recovery solution to lift the platform to safety. Enerpac later supplied them with 16 strand jacks and 120 ton of fabricated structures, and soon the platform was lifted to its required elevation and secured.

- PROJECT London Eye
- LOCATION London, England
- YEAR 1999
- EQUIPMENT HSL-SERIES HEAVY LIFTING STRAND JACKS

BUILDINGS / STADIUMS



Raising the “London Eye” on time to celebrate the new Millennium required an innovative mega crane. Powered by Enerpac HSL-Series strand jacks, the world’s tallest (135 meters) cantilevered observation wheel was successfully lifted, taking its position in the London skyline.



■ PROJECT	Nantong Stadium
■ LOCATION	Nantong, China
■ YEAR	2006
■ EQUIPMENT	PERMANENT HYDRAULIC INSTALLATION

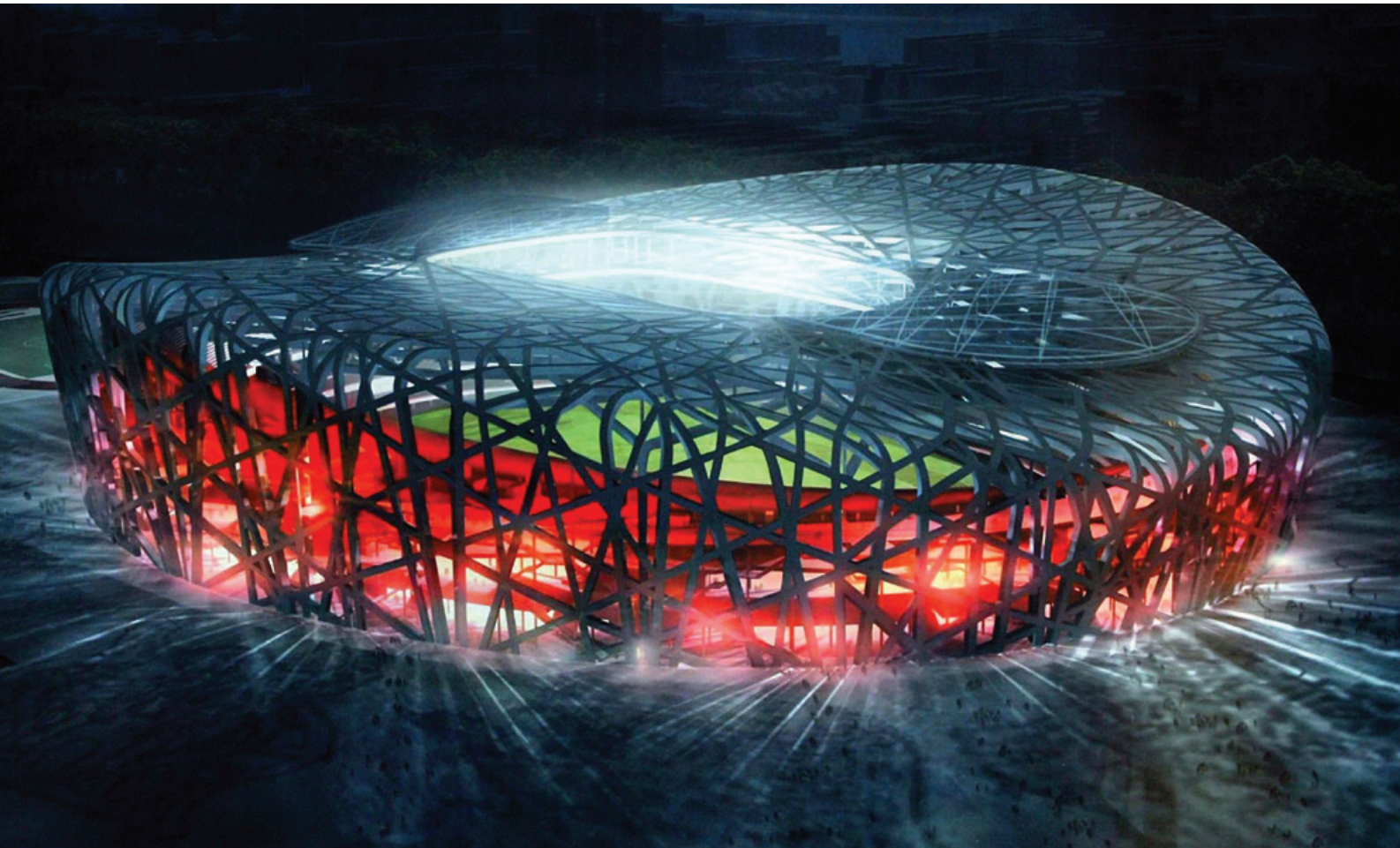
BUILDINGS / STADIUMS



Nantong stadium – China's first large stadium with an opening roof – is actuated with Enerpac hydraulics. Two 1100 ton hemi-spherical roof shells, supported by hydraulic cylinders mounted on mechanical trolleys, are driven by hydraulic winches to open and close the roof structure 60 meters. Enerpac's solution synchronises the roof positions and manages the dynamic load conditions – all from a centralised location.

■ PROJECT	Beijing National Stadium (Bird's Nest)
■ LOCATION	Beijing, China
■ YEAR	2006
■ EQUIPMENT	SYNCHRONOUS LIFTING SYSTEM

BUILDINGS / STADIUMS



Beijing's National Stadium provided a spectacular venue throughout the 2008 Olympic Games. The steel roof lacked structural integrity during construction, requiring the use of temporary supporting works. After the last piece of the 45.000 ton roof structure was installed, it needed to be 'de-propped.' This delicate procedure was managed by Enerpac Synchronous Lifting Technology, allowing the structure to vertically relax downward into exact position with the removal of temporary works.



- PROJECT Hydro-Cracker Installation
- LOCATION Alabama, USA
- YEAR 2009
- EQUIPMENT SELF-ERECTING STRAND JACK GANTRY



The Enerpac self-erecting tower combined strand jacking with hydraulic gantry and skidding technologies to form an integral, free-standing heavy lift and tailing solution. Transported in standard containers, automatic erection and takedown was completed at ground level, requiring only simple crange to lift the header's beams prior to raising the tower. This provided a 1200 ton by 50 meter lifting solution that was quickly and safely set up in a 'live' environment at low cost.



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